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(54) OIL-IN-WATER EMULSIFIER COMPOSITION COMPOSED OF ALKYLATED POLYSACCHARIDE AND COSMETIC USING THE SAME

(57)Abstract:
PROBLEM TO BE SOLVED: To obtain an oil-in-water emulsifier composition in which an alkylated polysaccharide is used and which has high environmental compatibility, biosafety and good stability and to provide a preparation for external use for skin, a cosmetic and a hair cosmetic using the same.
SOLUTION: A polyglycerol fatty acid ester is used jointly with an alkylated polysaccharide to attain the purpose.

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CLAIMS

[Claim(s)]
[Claim 1] Alkylation polysaccharide and the oil-in-water type emulsifier constituent characterized by containing the nonionic surfactant of HLB 3-16.
[Claim 2] The oil-in-water type emulsifier constituent characterized by alkylation polysaccharide according to claim 1 being one kind chosen from the polysaccharide obtained from a seaweed extract, a seed mucilage, a sap mucilage, a fruits mucilage, a microorganism production mucilage, and a fibrin system mucilage, or the alkylation polysaccharide which alkylated and carried out hydrophobing of the polysaccharide denaturation object, or two kinds or more.
[Claim 3] The oil-in-water type emulsifier constituent characterized by being one kind chosen from the alkylation polysaccharide to which alkylation polysaccharide according to claim 1 to 2 alkylated further guar gum, hydroxyalkyl denaturation guar gum, carboxy alkyl denaturation guar gum, and hydroxyalkyl carboxy alkyl denaturation guar gum, and carried out hydrophobing, or two kinds or more.
[Claim 4] The oil-in-water type emulsifier constituent characterized by for alkylation polysaccharide according to claim 1 to 2 alkylating a hydroxyalkyl cellulose further, and carrying out hydrophobing.
[Claim 5] the alkylation of alkylation polysaccharide according to claim 1 to 4 -- esterification and etherification -- and -- or -- glycidyl ether -- the oil-in-water type emulsifier constituent characterized by being-izing.
[Claim 6] The oil-in-water type emulsifier constituent with which a nonionic surface active agent according to claim 1 is characterized by being polyglyceryl fatty acid ester.
[Claim 7] The skin external preparations using an emulsifier constituent according to claim 1 to 6, cosmetics, and cosmetics for hair.

[Translation done.]

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[The technical field to which invention belongs] This invention relates to the oil-in-water type emulsifier constituent which has the high environmental compatibility and the living body safety by the macromolecule emulsifier constituent which consists of an alkylation polysaccharide and the skin external preparations which used them, cosmetics, and the cosmetics for hair.
[0002]
[Description of the Prior Art] In order to fully demonstrate the effectiveness and efficacy as a function desired in skin external preparations or cosmetics, and a still better feeling of an activity and to guarantee the stability of a product, various surfactants have been used as an emulsifier. Usually, the surface active agent which mainly has a polyoxyethylene radical in a hydrophilic group as a surface active agent used for these pharmaceutical preparation as an emulsifier was used, and pharmaceutical preparation preparation has been made by the emulsifying method using oleophilic amphiphile, such as the phase inversion emulsifying method by the sorbitan fatty acid ester and polyoxyethylene sorbitan fatty acid ester, and higher alcohol, fatty acid monoglyceride, polyoxyethylene alkyl ether, or the liquid crystal formed from polyoxyethylene fatty acid ester etc.
[0003]
[Problem(s) to be Solved by the Invention] However, an interest strong against the safety and the low stimulative one over the skin of skin external preparations or cosmetics comes to be paid, and from a viewpoint to environmental compatibility, compatibility is high by the living body or the environment, moreover, it is little as much as possible, and the emulsifier whose desirable emulsification is attained is called for. Furthermore, development of the emulsification technique which does not use a surfactant is activating. Especially, development of a "depolyoxyethylene system emulsifier" is demanded from problems, such as concern of the safety of a by-product over a polyoxyethylene system emulsifier, and deactivation of an active ingredient.
[0004] In order to solve these technical problems, the emulsifier and the emulsifying method which made the water soluble polymer the subject are proposed. For example, natural water solubility macromolecules, such as synthetic water soluble polymers, such as a long-chain alkyl denaturation object of polyvinyl alcohol, polyacrylate, a carboxyvinyl polymer, and an acrylic acid and a methacrylic-acid copolymer, a polypeptide, casein, and gelatin, etc. are mentioned.
[0005] Although there is an operation which sticks to an oil droplet front face and prevents coalescence of oil droplets since polyvinyl alcohol, polyacrylate, etc. are deficient in the capacity which is insoluble and lowers boundary tension to an oil in these, it is difficult to obtain a detailed oil-in-water type emulsification object. Moreover, the problem of being scarce is in biodegradability. Although the long-chain alkyl denaturation object of an acrylic acid and a methacrylic-acid copolymer has a certain amount of surface activity by the long-chain alkyl part in structure and demonstrates the emulsification force, it is not enough, and it is lacking also in biodegradability. Although natural water solubility macromolecules, such as a polypeptide, casein, and gelatin, are excellent in biodegradability, they are deficient in the emulsification force, and since it is a natural raw material, the variation in the lot-to-lot engine performance is large, and it is inconvenient practically. Moreover, the approach of using a water soluble polymer and a surfactant together is indicated as the approach of compensating lack of the emulsification force of these water soluble polymers. Specifically, the approach of combining a carboxyvinyl polymer, lecithin, a sorbitan fatty acid ester, etc. is mentioned. According to this approach, emulsification particle size becomes small comparatively and a stable emulsion is obtained. However, there is a problem in the compatibility to the

environment by the lowness of the biodegradability of a carboxyvinyl polymer.
[0006]
[Means for Solving the Problem] this invention person etc. is combining polyglyceryl fatty acid ester with an alkylation polysaccharide, as a result of inquiring wholeheartedly that these problems should be solved, and it found out that the oil-in-water type emulsifier constituent which has good emulsifiability ability, high environmental compatibility, and living body safety was obtained. Moreover, a header and this invention were completed for the ability of the skin external preparations which have good emulsifiability ability, high environmental compatibility, and living body safety, cosmetics, and the cosmetics for hair to be offered by using these.
[0007]
[Embodiment of the Invention] As an alkylation polysaccharide used for this invention, the alkylation object of the polysaccharide obtained from a seaweed extract, a seed mucilage, a sap mucilage, a fruits mucilage, a microorganism production mucilage, and a fibrin system mucilage or these denaturation objects can be used, a thing can be used, and the alkylation object of guar gum, locust bean gum, karaya gum, a tragacanth gum, xanthan gum, celluloses, or these denaturation objects can specifically be used.
[0008] As a nonionic surfactant used together with the alkylation polysaccharide used for this invention, if HLB is 3-16, an emulsification constituent can be prepared. Furthermore, when HLB is 5-7 preferably, a still better emulsification condition can be acquired. HLB as a nonionic surfactant of 3-16 Propylene glycol fatty acid ester, A glycerine fatty acid ester, polyglyceryl fatty acid ester, a sorbitan fatty acid ester, Polyoxyethylene sorbitan fatty acid ester, polyoxyethylene sorbitol fatty acid ester, Polyoxyethylene glycerine fatty acid ester, polyoxyethylene alkyl ether, Polyoxyethylene fatty acid ester, polyoxyethylene hydrogenated castor oil, polyoxyethylene castor oil, a polyoxyethylene polyoxypropylene copolymer, polyoxyethylene polyoxypropylene alkyl ether, etc. can be used.
[0009] Polyglyceryl fatty acid ester is desirable from a viewpoint of an emulsification condition and safety, and also environmental compatibility especially in these nonionic surfactants.
[0010] Although the addition of the alkylation polysaccharide used for this invention can be used 0.05 % of the weight to about 2.0% of the weight, it is 0.1 % of the weight - 1.0 % of the weight preferably. Since an alkylation polysaccharide requires time amount for making it dissolve in water, it prepares beforehand about 2% of the weight of the water solution, and can also use it.
[0011] Although an emulsification constituent can be prepared if the addition of the nonionic surfactant used for this invention is 0.2 % of the weight or more, 0.5 % of the weight - 2 % of the weight is desirable from a viewpoint of the stability of an emulsification constituent.
[0012] In the skin external preparations of this invention, in the range which does not spoil the effectiveness of this invention besides the above-mentioned indispensable component, cosmetics, The hardened oil of the animal-and-vegetable-oils origin as a component blended with skin external preparations, such as quasi drugs, The low of the natural origin, the oil phase component of a hydrocarbon system, the oil phase component of the animals-and-plants origin, the oil phase component of a silicone system, The oil phase component of a fluorine system, higher alcohol, a thickener, an ultraviolet ray absorbent, fine particles, A pigment, an anionic detergent, a cationic surfactant, a nonionic surfactant, polyhydric alcohol, sugar, a high molecular compound, a bioactive component, penetration enhancer, a solvent, an antioxidant, perfume, antiseptics, etc. can be blended.
[0013]
[Example] Although an example is given to below and this invention is explained to it still more concretely, the technical range of this invention is not limited to these. In addition, weight % shows loadings.
(1) According to the conventional method of the method-of-preparation oil-in-water type emulsifying method of a sample, the emulsification constituent of an example and the example of a comparison was prepared.
(2) The assessment approach emulsification constituent was left for one month in the room temperature and 45-degree-C thermostat, and the following criteria estimated the emulsification condition after neglect.
O : separation of an oil phase and the aqueous phase was not seen at all.
O : separation of some aqueous phase was seen.
**: Separation of an oil phase and the aqueous phase was seen.
x: Emulsification dissociated thoroughly.
[0014]
[A table 1]

		実施例1	実施例2	実施例3	比較例1	比較例2	比較例3
油相	流動パラフィン	10	10	10	10	10	10
	トリ2-エチルヘキサン酸グリセリル	10	10	10	10	10	10
水相	アルキル化グアーガム	0.2	0.2	0.2	0.2	0.2	0.2
	ﾓﾉｽﾃｱﾘﾝ酸ﾃﾄﾗｸﾞﾘｾﾘﾙ(HLB:6.0)	1.5					
	ﾎﾟﾘｵｷｼｴﾁﾚﾝ2ﾓﾉｽﾃｱﾚｰﾄ(HLB:4.0)		1.5				
	ﾎﾟﾘｵｷｼｴﾁﾚﾝ4ﾓﾉｽﾃｱﾚｰﾄ(HLB:8.9)			1.5			
	ﾎﾟﾘｵｷｼｴﾁﾚﾝ10ﾓﾉｽﾃｱﾚｰﾄ(HLB:11.6)				1.5		
	ﾎﾟﾘｵｷｼｴﾁﾚﾝ1ﾓﾉｽﾃｱﾚｰﾄ(HLB:2.0)					1.5	
	ﾎﾟﾘｵｷｼｴﾁﾚﾝ40ﾓﾉｽﾃｱﾚｰﾄ(HLB:17.6)						1.5
	水	残部	残部	残部	残部	残部	残部
乳化状態	常温	◎	○	○	△	×	×
	45℃	◎	○	○	△	×	×

[A table 2]

		実施例1	実施例4	実施例5	比較例4	比較例5	比較例6
油相	流動パラフィン	10	10	10	10	10	10
	トリ2-エチルヘキサン酸グリセリル	10	10	10	10	10	10
水相	アルキル化グアーガム	0.2	0.2	0.2	0.2	0.2	0.2
	ﾓﾉｽﾃｱﾘﾝ酸ﾃﾄﾗｸﾞﾘｾﾘﾙ(HLB:6.0)	1.5					
	ﾓﾉｽﾃｱﾘﾝ酸ﾍｷｻｸﾞﾘｾﾘﾙ(HLB:3.0)		1.5				
	ﾄﾘｽﾃｱﾘﾝ酸ﾃﾞｶｸﾞﾘｾﾘﾙ(HLB:7.0)			1.5			
	ﾓﾉｵﾚｲﾝ酸ﾃﾄﾗｸﾞﾘｾﾘﾙ(HLB:5.0)				1.5		
	ﾍﾝﾀｽﾃｱﾘﾝ酸ﾃﾞｶｸﾞﾘｾﾘﾙ(HLB:3.5)					1.5	
	ﾓﾉｽﾃｱﾘﾝ酸ﾃﾞｶｸﾞﾘｾﾘﾙ(HLB:12.0)						1.5
	水	残部	残部	残部	残部	残部	残部
乳化状態	常温	◎	○	○	○	×	×
	45℃	◎	○	○	○	×	×

As seen in a table 1 and a table 2, when the nonionic surface active agent of alkylation polysaccharide and HLB 3-16 is used together and the nonionic surface active agent of HLB 5-7 is used together still more preferably, a good emulsification constituent is obtained. Furthermore, if polyglyceryl fatty acid ester is used as a nonionic surface active agent, the problem of the skin stimulus by the decomposition product when using the nonionic surface active agent of an ethylene oxide system can be avoided, and it can be expected that safety can prepare cosmetics with good environmental compatibility highly.

[0015] Furthermore, although the example in a concrete cosmetics formula is shown below, there is nothing at that to which the technical range of this invention is limited.

Example 6 : A moisturization cream (formula) Weight % oil phase Macadamia-nuts oil 5.0 Squalane 5.0 Palmitic-acid iso octyl 3.0 Decamethyl cyclopentasiloxane 4.0 Behenyl alcohol 1.5 Hydrogenation soybean phosphatide 0.3 Tocopherol 0.1 Propylparaben 0.1 aqueous phase Alkylation guar gum 0.5 Monostearin acid tetra-glyceryl 1.5 Polyethylene glycol 2.0 Glycerol 1.5 1, 3-butylene glycol 1.5 Urea 1.0 Methylparaben 0.2 Water It prepared like the remainder (method of preparation) examples 1-5 and the examples 1-6 of a comparison.

Example 7 : An aging prevention cream (formula) Weight % oil phase Tori 2-ethylhexanoic acid glyceryl 6.0 Olive squalane 8.0 Decamethyl cyclopentasiloxane 4.0 Methyopolysiloxane 0.3 Beeswax 1.5 Behenyl alcohol 1.5 Tetra-2-hexyl decanoic-acid ASUKORUBIRU 1.0 Glycyrrhetinic acid stearyl 0.2 4-tert-butyl-4'-methoxydibenzoylmethane 0.3 Propylparaben 0.1 aqueous phase Alkylation hydroxyethyl cellulose 0.5 Monostearin acid tetra-glyceryl 1.5 Glycerol 3.0 hamamelis extract 0.2 Methylparaben 0.2 Water It prepared like the remainder (method of preparation) examples 1-5 and the examples 1-6 of a comparison.

Example 8 : A whitening cream (formula) Weight % oil phase Liquid paraffin 10.0 Tori 2-ethylhexanoic acid glyceryl 10.0 Behenyl alcohol 1.5 Self-emulsification mold stearin acid mono-glyceryl 1.5 Propylparaben 0.1 aqueous phase Alkylation guar gum 0.5 Monostearin acid tetra-glyceryl 1.5 Methylparaben 0.2 Phosphoric-acid L-ascorbyl magnesium 3.0 Water It prepared like the remainder (method of preparation) examples 1-5 and the examples 1-6 of a comparison.

Example 9 : A sunscreen cream (formula) Weight % oil phase Alpha olefin oligomer 2.0 Palmitic-acid 2-ethylhexyl 3.0 Decamethyl cyclopentane siloxane 5.0 Para methoxycinnamic acid octyl 6.0 Salicylic-acid octyl 3.0 Propylparaben 0.1 aqueous phase Alkylation guar gum 0.5 Monostearin acid tetra-glyceryl 1.5 The Pori ricinoleic-acid hexa glyceryl 0.5 N-stearoyl methyl taurine sodium 0.3 Methylparaben 0.2 1, 3-butylene glycol 5.0 Water It prepared like the remainder (method of preparation) examples 1-5 and the examples 1-6 of a comparison.

Example 10 : The milky lotion for the bodies (formula) Weight % oil phase Macadamia-nuts oil 5.0 Palmitic-acid 2-ethylhexyl 3.0 Decamethyl cyclopentane siloxane 5.0 The amount silicone of macromolecules 1.0 Behenyl alcohol 1.0 Propylparaben 0.1 aqueous phase Alkylation guar gum 0.5 Monostearin acid tetra-glyceryl 1.5 Stearoyl sodium lactate 0.05 Methylparaben 0.2 1, 3-butylene glycol 5.0 Glycerol 2.0 Polyethylene glycol 3.0 Water It prepared like the remainder (method of preparation) examples 1-5 and the examples 1-6 of a comparison.
(The assessment approach) It carried out like examples 1-5 and the examples 1-6 of a comparison.
[0016]
[A table 3]

		実施例6	実施例7	実施例8	実施例9	実施例10
乳化状態	常温	◎	◎	◎	◎	◎
	45℃	◎	◎	◎	◎	◎

All of the cosmetics formula of examples 6-11 show a good emulsification condition.
[0017]
[Effect of the Invention] As mentioned above, as explained to the detail, environmental compatibility and living body safety can offer an oil-in-water type emulsifier constituent with good stability highly by using polyglyceryl fatty acid ester together to alkylation polysaccharide. Furthermore, skin external preparations with good stability, cosmetics, and the cosmetics for hair can be offered highly [environmental compatibility and living body safety] using these.

[Translation done.]